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# Integrated Management of Knee Osteoarthritis Associated Hypertension with Naturopathy and Yoga: A Case Report

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# ABSTRACT:

Osteoarthritis of the Knees (OA Knees) also known as degenerative arthritis or degenerative joint disease is a group of mechanical abnormalities involving the degradation of joints, including articular cartilage and subchondral bone. Associated comorbid conditions such as hypertension increase the symptoms. Allopathic drugs taken to relieve the symptoms have their own side effects. The aim of treatment with naturopathy, yoga, and diet therapy is the reduction of symptoms and an increase in functional activities of patients with osteoarthritis of the knees. Naturopathy and therapeutic yogic exercises reduce pain, improve the strength of the joints, and support muscles and ligaments which provides good flexibility of the joints, and increases the range of motion. Diet plays a major role to prevent and control degeneration. A Vitamin D-rich diet helps to regenerate the joint wear and prevents worsening of the knee symptoms. Osteoarthritis may lead to early disability condition which needs to be managed as soon as possible. Osteoarthritic management requires a holistic approach.

**Keywords:** Osteoarthritis (OA), Naturopathy and Yoga, Traditional Chinese medicine, Physiotherapy, diet control.

# **INTRODUCTION**

Osteoarthritis (OA) is a chronic degenerative joint disorder characterized by loss of articular cartilage, hypertrophy of bone at the margins, subchondral sclerosis, and alteration in the synovial membrane of the joint.<sup>1</sup> The clinical features of OA include joint pain with limited activity, morning stiffness, restricted motion, joint crepitus, per articular tenderness, bony swelling, and functional disability.<sup>2</sup> Osteoarthritis is more common in women than men but the prevalence increases dramatically with age. A 45% of women over the age of 65 have symptoms while radiological evidence is found in 70% of those over 65 years. However, in India overall prevalence of OA is 2239%.<sup>3</sup> Additional structural changes include cartilage fibrillation, degeneration of articular cartilage, thickening of subchondral bone, osteophyte formation, and synovial inflammation, degeneration of ligaments and meniscus, hypertrophy of joint capsule, cellular and molecular changes in nerves, as well as changes to periarticular muscle, bursa, and fat pads.<sup>4</sup> According to World Health Organization (WHO), 18.0% of women and 9.6% of men over the age of 60 years have symptomatic OA worldwide. They have limitations in movement in 80% of cases while 25% of them cannot perform their major day-to-day activities of life.<sup>5,6</sup> The purpose of the present study was to



assess the effect of Yoga, Naturopathy and diet control in reducing pain and improving functional status in patients with OA of Knees.

# CASE DISCUSSION

A 76-Year-old female patient visited Yog Wellness Center, Sultanpur, Uttar Pradesh, India with presenting complaints of pain in bilateral knees for 12 years. Right knee pain is more prominent than left knee and more in the back region of the joint. History of pain in the bilateral knee joint and swelling with morning stiffness, the pain was continuous till 15-20 minutes after waking up from bed and then it becomes gradually normal. She described the pain as a deep ache, more in the anterio-medial aspect of both the knees and it was aggravated while climbing stairs, in longstanding as well as while walking for a longer distance. Usually, her pain got relieved by taking medication (NSAIDs). She also complained irregular bowel movement, headache and fatigue. She was hypertensive for 12 years and diagnosed for OA in 2012. Her appetite was good with a vegetarian diet. She had normal thirst, sweat and disturbed sleep due to pain, irregular bowel movements and frequent micturition and 2 cups of tea per day. Her pulse rate was 78 per minute and regular, with blood pressure of 168/100 mmHg, temperature of 98.6<sup>o</sup> F, respiratory rate of 22 per minute, height of 4.2 feet, weight of 50 kg, and BMI of 30.9. Systemic examination showed normal S1 and S2 sound, clear respiratory system, distended abdomen, oriented, alert, with swelling, tenderness, stiffness, crepitus in both the knees. SLR of right hip joint was 30 degrees and of left 45 degrees. Both the knee joints felt warm, limping in the gait, on alternate leg raising, pain on the back of the knee (Popliteal fossa) and posterior side of the thigh. Obers Test of both knees showed limited extension and flexion. Anterio-posterior Xray views of both knee joints revealed osteophyte formation, the joint space reduction appeared to be fairly noted on the right and left knee joint of the medial tibiofemoral joint. (Figure 1-2) Pain in right knee joint (scale-9) was slightly more than left knee joint (scale-8). She was taking Tab. Nervmax-D, Bindbone capsule, Tab. Kenacort-4mg, Tab. Ultracet, Tab.Calpol, Tab. Pantop 40, Tab. ZAC-D , and Tab. Tryptomer. Other associated parameters are depicted in Table 1-3.

#### **Treatment Progress**

After 14 days of treatment, she felt good and relaxed. There was a change in vital parameters (**Table 1**) and relieve in pain, crepitus, stiffness, warmness, and tenderness, and an

increase in straight leg range, range of motion and muscle strength grade test. (**Table 2-3**) Her lipid profile was also improved. The liver function test and Thyroid function test were normal. (**Figure 3-6**)

Follow-up instructions were given as regular eating of natural diet preferably two times in a day, loosening exercise, Yogasana, Pranayama, relaxation twice in a day, expose body to sunlight and fresh air as far as possible, knee pack with Epsom salt, hot foot bath, massage of legs twice in a day, chew well and eat with a peaceful mind, and drink water 4 to 5 liter per day. Avoid coffee, tea, oily and fried food, frozen /processed/fast/preserved/ refined edible items, white flour, white sugar, saturated fats/ over eating/ untimely eating, late lunch, dinner/ late sleep, intake of water immediately before and after food, stress, anger, worry, hurry, depression, anxiety etc.

# DISCUSSION

Naturopathy, Yoga and Diet therapy, have been proven to be effective in the management of OA. Hydrotherapy or water therapy is the application of water that initiates healing. Three states of water (liquid, steam, and ice) can be used therapeutically. The goals of hydrotherapy are to increase the circulation and quality of blood. Hydrotherapy has substantiated to be a highly effective type of natural therapy that works by stimulating the endorphins which in turn help to relieve tension and pain. The hot compress or hot pack will increase blood circulation to the area and relax the muscles while the cold compress helps reduce inflammation.<sup>7</sup> Mud has anti-inflammatory, pain-relieving and revitalizing actions. It relaxes the muscles and increases resistance to pathogens. Thermal mud is said to prevent or cure chronic inflammatory problems and rheumatic illnesses.8 Massage therapy may diminish symptoms and improve the course of OA by increasing local circulation to the affected joint, improving the tone of supportive musculature, enhancing joint flexibility, and relieving pain.<sup>9</sup> Epsom salts are high in magnesium sulfate mineral. Epsom salt compress helps to pull toxins from the body, which enhances the healing process and relieve joint pain.<sup>10</sup> Mustard is rich in copper, magnesium, iron, and selenium relieves spasms, backbone pain and other muscular aches.<sup>11</sup> Ultrasound reduces pain and swelling and are very useful in the treatment of functional disorders in patients with degenerative diseases.<sup>12</sup> Acupuncture is most effective for reducing osteoarthritic pain, and improvements in functional mobility. With its analgesic effects, acupuncture is widely used and a relatively safe

non-pharmacological treatment of musculoskeletal pain.<sup>13</sup> Reflexology is applied to the specific reflex points which are located on all parts of feet, hands, or ears. Applying pressure on these reflex areas of the whole body stimulates the normal functions of glands, organs as well as parts of the body and finally encourages the body's healing process.<sup>14</sup> Phytochemicals are found in vegetables, fruits, whole grains, legumes and nuts and in other plant-based foods. They modify and reduce oxidative stress and inflammation and, thus, protect organisms.<sup>15</sup> Daily 45 minutes practicing of Yoga balances our physical and mental conditions. Asanas strengthen muscle, increase flexibility, balance and the co-ordination of the mind, body and breath, in combination with pranayama and meditation exercise to calm the mind and develop self-awareness.<sup>16</sup>

### CONCLUSION

The findings of this case report suggest that Naturopathy and Yoga, Physiotherapy, and Traditional Chinese Medicine with proper diet modification help to alleviate the symptoms of osteoarthritis.

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S. No.	Vital data	Pre- treatment	Post- treatment
1.	Pulse rate	78/minute	74/minute
2.	Respiratory rate	22/minute	18 /minute
3.	Blood pressure systolic	168 mmHg	146 mmHg
4.	Blood pressure diastolic	100 mmHg	88 mmHg
5.	Weight	50 kg	49 kg
6.	B.M.I	30.5	29.9

**Table1: Vital Parameters Pre – treatment and Post-treatment** 

#### Table2: Clinical Examination Pre- treatment and Post- treatment

S.No.	Clinical feature	Pre- treatment	Post- treatment
1.	Pain Scale	Right knee-9	Right knee-4
		Left knee-8	Left knee-3
2.	Crepitus	Present	Decrease
3.	Stiffness	Present	Decrease
4.	Warmness	Present	Decrease
5.	Tenderness	Present	Decrease
6.	SLR	Right-30°	Right- 60°
		Left-45°	Left- 90°
7.	ROM	Right lying knee ext. = $0 - 5^{\circ}$	Right lying knee ext. = $0-10^{\circ}$
		Right knee flex. = $0 - 100^{\circ}$	Right knee flex. = $0 - 110^{\circ}$
		Left lying knee ext. = $0 - 10^{\circ}$	Left lying knee ext. = $0 - 15^{\circ}$
		Left knee flex. = $0 - 110^{\circ}$	Left knee flex. = $0 - 120^{\circ}$
		Right ankle inversion rotation= 0-20°	Right ankle inversion rotation=0-25°
		Right ankle eversion rotation=0-10°	Right ankle eversion rotation= 0-15°
		Left ankle inversion rotation=0-20°	Left ankle inversion rotation= 0-25°
		Left ankle eversion rotation= 0-10°	Left ankle eversion rotation=0-15°
8.	MSGT	Right knee Grade test= 2 (Poor)	Right Knee Grade test= 3 (Fair)
		Left knee Grade test= 3 (Fair)	Left Knee Grade test= 4 (Good)

#### **Table 3: Hematological Parameter Pre-treatment and Post-treatment**

S. No.	Test Name	Pre-treatment	Post-treatment
1.	Hemoglobin	12 gm/dl	11.1 gm/dl
2.	Platelet count	185000/cu.mm	193000/cu.mm
3.	ESR	20 mm/hr	14 mm/hr
4.	Creatinine	0.68 mg/dl	0.66 mg/dl
5.	CRP	2.97 mg/L	2.09 mg/L
6.	25-OH Vitamin D	20.1 ng/ml	24.9 ng/ml
7.	Vitamin -12	198 pg/ml	204 pg/ml
8.	Urea/SR. Creatinine Ratio	63.21 ratio	60.31 ratio
9.	BUN/SR. Creatinine Ratio	29.12 ratio	28.18 ratio

#### **Treatment Plan and Treatment Progress**

Conservative management was started with Yoga, Naturopathy, Traditional Chinese Medicine and Diet control.

S.No.	Name of treatment	Duration	Frequency
1.	Hydrotherapy		
	Hot Foot bath with Epsom salt	10 minute	14 times
	Steam bath with chest pack	10 minute	5 times
	Local steam on legs	10 minute	9 times
	Woolen and cotton pack on abdomen and knees	20 minute	14 times
	Hot and Cold Fomentation on abdomen	30 minute	7 times
2.	Mud therapy	-	
	Mud pack on Abdomen and eyes	30 minute	7 times
	Hot mud pack on legs	20 minute	7 times
3.	Manipulative therapy		
	Full body massage	45 minute	5 times
	Massage on legs	20 minutes	9 times
4.	Naturopathy Packs		
	Oil + Epsom salt pack on Both knees	30 minutes	7 times
	Mustard pack on both knee	30 minutes	7 times
5.	Sun bath	20 minutes	7 times
6.	Physiotherapy	I	l
	Infra-red rays on knees	10 minute	7 times
	Ultra sound on knees	10 minute	7 times

#### Table 4: Naturopathic Management

#### **Table 5: Naturopathic Management Continued**

S.No.	Name of treatment	Points upon the body	Duration	Frequency
7.	Acupuncture	Acupuncture points- Du- 20, LI-4, LI-11, St-34 ,St-35 ,St-	20 minutes	7 times
		36, St-44, Sp - 9, 10, UB – 11 ,UB- 32,UB-36, UB-40, UB-54, GB –34, Ex- 31,Ex-32		
8.	Reflexology	Reflexology upon Foots	10 minutes	14 times

# Table 6: Yogic therapy

S.No.	Name of Yogic treatment		Duration
1.	Loosening exercise		10 minutes
		Neck movements	
		Wrist, elbow and shoulder movements	
		Lumber twisting and rotation	
		Knee flexion and extension movements	
		Ankle movements	
2.	Asana		10 minutes
		Tadasana	
		Ardhkatichakrasana	
		Katichkrasana	
		Ardha salabhasna	
		Bhujangasana	
		Salabhasana	
		Makrasana	
		Uttanpadasana	
		Udarakarsan	
		Setubandhasana	
		Savasana	
3.	Pranayam		10 minutes
		Anulom- Vilom	
		Sheetli pranayam	
		Sheetkari pranayam	
		Bhramari pranayam	
5.	Relaxation		10 minutes
		Instant relaxation technique (IRT)	2 minutes
		Quick relaxation technique (QRT)	3 minutes
		Deep relaxation technique (DRT)	5 minutes
6.	Meditation	OM Kara meditation	5 minute

# Table 7: Diet therapy

Time	Name of ingredients
7:00 am	Fenugreek kadha / Giloy Kadha
8:00 am	Sprouted green gram and fenugreek, 4-5 almond, 7-8 black raisins, 2-3 walnut, 3-4 cashew and one seasonal
	fruits.
10:00 am	Carrot juice/ bottle guard juice
1:00 pm	Ragi roti -2, steam green vegetable, Green chutney
3 :00 pm	Papaya/ Apple/ Orange/ Pomegranate / Coconut water or Lemon honey water
5 :00 pm	Beetroot soup/ Tomatoes soup/ Drumstick soup
7 :00 pm	Ragi roti 1 or 2 with steam green vegetable or Green vegetable daliya one medium bowl.

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Figure 1: X-rays showing Osteoarthritic changes



Figure 2: Photographs of the patient

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Lab No. BLD02973	Reporting Stage	Final	
TEST REPORT STATUS FINAL			
TEST NAME	Result	UNIT	Ref.Range
Creatinine		SAMPLE : SERUM	
Serum Creatinine	0.68	mg/dl	0.5 - 0.9
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GPT (ALT)		SAMPLE : SERUM	
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RP- C Reactive Protein		SAMPLE : SERUM	
C Reactive Protein (CRP)	2.97	mg/L	< 3
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Figure 3: Pretreatment investigations

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TEST NAME	TECHNOLO	GY VALUE	UNITS	NORMAL RAN
UREA (CALCULATED)	CALCULATED	39.8	Ratio	Adult : 17-43
BLOOD UREA NITROGEN (BUN)	PHOTOMETR		mg/di	7 - 25
UREA / SR.CREATININE RATE			Ratio	< 52
CREATININE - SERUM	PHOTOMETR		mg/di	0.5-0.8
BUN / SR.CREATININE RATIO	CALCULATE		Ratio	9:1-23:1
URIC ACID	PHOTOMETR		mg/dl	8.8-10.6
SODIUM	J.S.E	140.7	mg/dl mmol/i	3.2 - 6.1 136 - 145
CHLORIDE	LS.C	99.4	mmol/I	96 - 107
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Figure 5: Post-treatment investigations

MANAGEMENT CONTROL CANNOT CAN	SAHARA HOSPITAL GOMTI NAGAR, LUCKNOW-226010 (A unit of Sahara India Medical Institute Limited)		Curl	OSPITAL ng Through Ca
P. No. CONT DOT INSAUCHAN Service 24196 - Service Produkt Area Service P	(A unit of sahara India Medical Institute Limited)		and the second se	
Marke CAPT DOPY MS-NUCHAN     Service mended 49 Ms.     Movellas 13, 041/2012     Bedon 03 Ms.     Service mended 40 M	0410 12012305	Receipt No		
Namba Da Jano Marka Mark	IP. No.			
Based Date         13/04/2012           Barber Date         Barber Date           EST REPORT STATUS         FINAL           EST RAME         Barber         UAST           EST REPORT STATUS         State St				
Ballow         ADDI 1990         Reporting Stager         Final           EST REPORT STATUS         FINAL         Reacht         MATT         Ref Asriget           EST REPORT STATUS         FINAL         Reacht         MATT         Ref Asriget           EST RAME         Reacht         MATT         Ref Asriget           Internet RLODG COUNT(CEC)         12.0         StateFLit, VMS EDTA         1215           TLO-TOTAL LEUCOCYTE COUNT         9800         (/u.mm         4000-11000           Expression         22         %         20-43           Expression         3         %         16           Monocycle         03         %         0120           Expression         3         %         16           Monocycle         03         %         022           Expression         Matter         000         %         022           Expressional Associations         Matter         0.000         %         022           Expressional Associations         Matter         155000         for amm 150000         %           Expressional Associations         Matter         030         mm/m         030           Massa mesogenet)         End of Report <td></td> <td></td> <td></td> <td></td>				
EST REPORT STATUS         NUL           EST REPORT STATUS         Bould         NUL         Ref. Nut         Ref. Nut           STATUS         Sample 1 VB SDTA         Opplet 1 VB SDTA         Opplet 1 VB SDTA           Charlest E BLOOD COUNT(CCC)         12.0         Grand 12.1-15         Opplet 1 VB SDTA           TACTOTAL ELECOCYTE COUNT         9000         10.20         Moneyte         00         %         40-70           Long Froncysia         03         %         1-6         Samplet 1 VB SDTA         00         10.20           Statustic         03         %         0-72         10.20         10.20         10.20           Moneyte         03         %         0-22         10.20 </td <td></td> <td></td> <td></td> <td></td>				
Besuit         Besuit         UNIT         Ref. Marging           ORPUTE ELOD COUNT(CRC)         12.0         gm/d1         12.15           T.C.TUTAL ELOCOCYTE COUNT         900         10.0         10.0           T.C.TUTAL ELOCOCYTE COUNT         0         %         40.2.15           Boschell         03         %         1.2.5           Experimental LEUCOCYTE COUNT         00         %         40.2.75           Experimental LEUCOCYTE COUNT         0.3         %         1.4           Boschell         0.3         %         0.2           Boschell         0.3         %         0.2           Boschell         0.3         %         0.2           Particle COUNT         105000         /cu.mm         150000 - 400000           Arrent COUNT         185000         /cu.mm         150000 - 400000           Boschell         20         am/dr.         0.30           Bruthorgen Sedimentation Rate         20         am/dr. <td>ab No. ALD01999</td> <td>Reporting Stage</td> <td>Final</td> <td></td>	ab No. ALD01999	Reporting Stage	Final	
List Mater         List           Deptifier ELOD COUNT(CRC)         54MPLE; WE EDT: (Journal of the second of the sec	TEST REPORT STATUS FINAL			
OMPLIET BLODU COURT         12.0         gr/vid         1215           HARROLDING, BLOOD         12.0         gr/vid         1215           TLC-TOTAL LEUCOCYTE COURT         9000         (gr.vim         4000-11000           LCDFFFRENTIAL LEUCOCYTE COURT         9000         40.0         1000           LCDFFFRENTIAL LEUCOCYTE COURT         900         40.0         10.0           Longhonghil         23         %         20-45           Epsingphil         03         %         210           Monocytie         03         %         0-2           LETELET COURT         185000         (nume 150000 - 0.00000           PLATELET COURT         185000         (nume 150000 - 0.00000           SR         Exploredynation Rate         20         sample: una CTRATE           Bascophal         20         men/hr         0-30           Manad transform         End of Roon         0 - 30	TEST NAME	Result	UNIT	Ref.Range
HALHAGLOBIN, BLOOD         12.0         σπ/dil         12-15           TLC-TOTAL LEUCOCYTE CONNT         9500         /σ.ε./mm         400-1000           UC-TOTAL LEUCOCYTE CONNT         9500         /σ.ε./mm         400-1000           Unrefron/Table         02         %         20-45           Eodinaphil         05         %         2-10           Bacophil         00         %         0-7           Latterr CONT         005         %         2-10           PARTEET CONT         165000         /cu.rvm         150000-40000           Bacophil         00         %         0-72           Latterr CONT         165000         /cu.rvm         150000-40000           Bacophil         0         %         0-30           Standardend decement         20         mm/hr         0-30           Standardend decement         20         mm/hr         0-30	COMPLETE BLOOD COUNT(CBC)	and the second s		
TLC-TOTAL LEBCOK/TE COUNT TLC-TOTAL LEBCOK/TE COUNT Numbrooli Lumphoops Epsinophi 03 % 20-45 100 100 100 100 100 100 100 10				
Noti-coold         60         %         60 - 70           Long-book         32         %         20 - 45           Explorephil         03         %         1 - 6           Monoryth         05         %         2 - 10           Barcophil         00         %         0 - 2           URLET_COUNT         105000         /Ku mm         150000 - 400000           PATELET COUNT         155000         /Ku mm         150000 - 400000           Securemond Annual event of Count and the secure and Annual event of Count Annual Count and the secure and Annual event of Count Annual Count and the secure and Annual event of Count Annual Count and the secure and Annual event of Count and the secure and Annual event of Count and the secure and Annual event of Count and the secure and the secur	TLC-TOTAL LEUCOCYTE COUNT	9800	/cu.mm	4000 - 11000
Neutrophil         00         %         20 - 45           Edurophil         03         %         1 - 6           Monocytie         03         %         2 - 10           Bacophil         03         %         0 - 2           Monocytie         03         %         0 - 2           Bacophil         03         %         0 - 2           Monocytie         185000         (cumm: 150000 - 400000           PLATELET COUNT         185000         (cumm: 150000 - 400000           SE         EMAPEL: VIX CITRATE         EMAPEL: VIX CITRATE           Explore.optic Sciences         0 - 30         mm/hr         0 - 30           wasat reservers)	DLC-DIFFERENTIAL LEUCOCYTE COUNT			
Lumphoopie 12 % % 16 Boschaphi 03 % 210 Boschaphi 03 % 02 Boschaphi 03 % 02 LUTELET COURT 185000 / /CU.NM 150000 - 400000 PLATELET COURT 185000 / /CU.NM 150000 - 400000 Recent and descented of duality Berger Court 18500 / /CU.NM 150000 - 400000 Recent and descented of duality Explore Sedimentation Rate 20 mm/br 030 mm/br 050 Berger 0	Neutrophil			
Epideophi 00 % % 2 - 10 Monocyte 00 % % 0 - 2 Bascohi 00 % % 0 - 2 LTELET COUNT PLATELET COUNT PLATELET COUNT ST Exhrocyte Solumentation Rate 20 mm/br 0 - 30 MMPEL VISION 0 - 30 MMPEL VISIO	Lymphocyte			
Monocyte o	Eosinophil			
Basophi 60 n LATELET COUNT 185000 (cu.nm 150000 + 400000 PATELET COUNT 150000 + 400000 SS SAMPEL VIO CITATE Exhronge Sadmentation Rate 20 enryfre 0 - 30 wasad resequent) End of Report End of Report SAMPELCOURT	Monocyte			
PLATELET COUNT 19000 - 90,0000 servicence de accessory Section 2000 - 90,0000 SE Exploreors Sectionantation Rate 20 mm/hr 0 - 30 wasan reserver)	Basophil	00	70	0-2
PLATELET COUNT PLATELET COUNT SR Same average device de catalog SR Exploreors to Same average de la construction Rate average treasequenci average treasequenci average treasequenci brissables Courtria SAME Courtria SAME Courtria	LATELET COUNT		-	150000 - 400000
SR Explored Sedimentation Rate 20 mm/br 0 - 30 waves reserved		185000	/cu.men	130000 400000
SR Dythorghe Sadimentation Rate 20 mmy/kr 0 - 30 www.artmenogen/)	régenout:Method: Automated coll counter)		CAMPLE - WE CITE	ATE
Enytheopte Sedimentation Rate 20 when the wave transport	SR	20		
		20		
D-SUBER CAPTA	Human Westergren)	ind of Report-		
PATHOLOGIST			1	
PATHOLOGIST			A	/
PATHOLOGIST			Dr SLIRBHE C	AIPTA
PEDAU NATE & DEC MAN PATHOLOGIST				
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Figure 4: Pretreatment investigations

PROCESSED AT : Thyrocare CP-67, Viraj Khand, Gambi Nagar, Lucknow - 226 010				S Thyrocare instruction train
Cerpordte office Thyro	care Technologies Limiter 12 3400 19 987006633	, PD AF/3/T	TE MIDE, Turbhe, Navil	Mornfaik - 400 703
C1 022 - Med (MAS / 51	12 3400 13 36 VOILLAS	REPORT	And and the lot of the lot of the	No. of the owners where the owners
NAME : GOMATI DEVI (7	EV RED	Concernance and	SAMPLE COL	ECTED AT -
NAME : GOMATI DEVI (7			(2280018416)	HEALTH CITY PATHOLOGY
TEST ASKED I ESR, HEALC, HEMO	GRAM		SULTANPUR, 2	APLEX UCO BANK SUPER MARKET 28001
TEST NAME	10	VALUE	UNITS	REFERENCE RANGE
TOTAL LEUCOCYTES COUNT (WBC	1	8.3	X 10* / UL	4.0-10.0
NEUTROPHILS		71.1	96	40-80
LYMPHOCYTE PERCENTAGE		24.3	%	20.0-40.0
MONOCYTES		3.1	9/0	0.0-10.0
EOSINOPHILS		1	9%	0.0-6.0
BASOPHILS		0.2	9%	<2 0.0-0.4
IMMATURE GRANULOCYTE PERCEN	ITAGE(IG%)	0.3	90	
NEUTROPHILS - ABSOLUTE COUN	E STORAGE STORAGE	5.9	X 103 / pL	2.0-7.0
LYMPHOCYTES - ABSOLUTE COUN	The second in the second second	2.02	X 10 <sup>3</sup> / UL	0.2-1.0
MONOCYTES - ABSOLUTE COUNT		0.26	X 107 / UL	0.02-0.1
BASOPHILS - ABSOLUTE COUNT		0.02	X 103 / UL	0.02-0.5
EOSINOPHILS - ABSOLUTE COUNT		0.08	X 10 <sup>3</sup> / µL X 10 <sup>3</sup> / µL	0.02-0.3
IMMATURE GRANULOCYTES(IG)		3.68	X 10^6/W	
NUCLEATED RED BLOOD CELLS		3.68	X 10 <sup>3</sup> / uL	<0.01
UCLEATED RED BLOOD CELLS		Nil	16 A	<0.01
IUCLEATED RED BLOOD CELLS %		11.1	g/dL	12.0-15.0
EMATOCRIT(PCV)		38.9	9%	36.0-46.0
EAN CORPUSCULAR VOLUME	MCV	105.7	1	83.0-101.0
EAN CORPUSCULAR HEMOGLOBI		30.2	00	27.0-32.0
HEAN CORP.HEMO.CONC(MCH		28.5	g/dL	31.5-34.5
RED CELL DISTRIBUTION WID		59.2	n	39.0-46.0
RED CELL DISTRIBUTION WID		14.9	%	11.6-14.0
PLATELET DISTRIBUTION WIC		25.2	TL	9.6-15.2
MEAN PLATELET VOLUME (MPV	D A A A A A A A A A A A A A A A A A A A	14.3	n	6.5-12
PLATELET COUNT	ALS AND STORE AND AND	135	X 10* / µL	150-100
PLATELET TO LARGE CELL RAT	IO(PLCR)	55.7 0.15	9%	19.7-42.4 0,19-0.39
PLATELETCRIT(PCT) Remarks 1 Alert11 Prodominantly norm				
Picase Conveste with difficult condition Healped : Publy sustainated bid/section (Tiles device performs homatology as Cytemetry Hethod (using a semicond	al analyser (6 Part Diffe alyzes according to the			red], Flow
Sample Collected on (SCT)	204 Aug 2022 07		0	C
Sample Received on (SRT)			trup	1.
	: 04 Aug 2022 15		-	(har
Report Released on (RRT)	: EDTA		and the state of the second second	
Report Released on (RRT) Sample Type		506 Dr P	riya Singh, MD (Path	<ol> <li>Dr.Caesar Sengupta MI</li> </ol>
Sample Type	: 0408040122/AF			
Sample Type Labcode		and the second		Page: 3 of 13
Sample Type	; 0408040122/AF ; V1803667			Page: 3 of 13
Sample Type Labcode				Page: 3 of 13
Sample Type Labcode				Page: 3 of 13

Figure 6: Post-treatment investigations